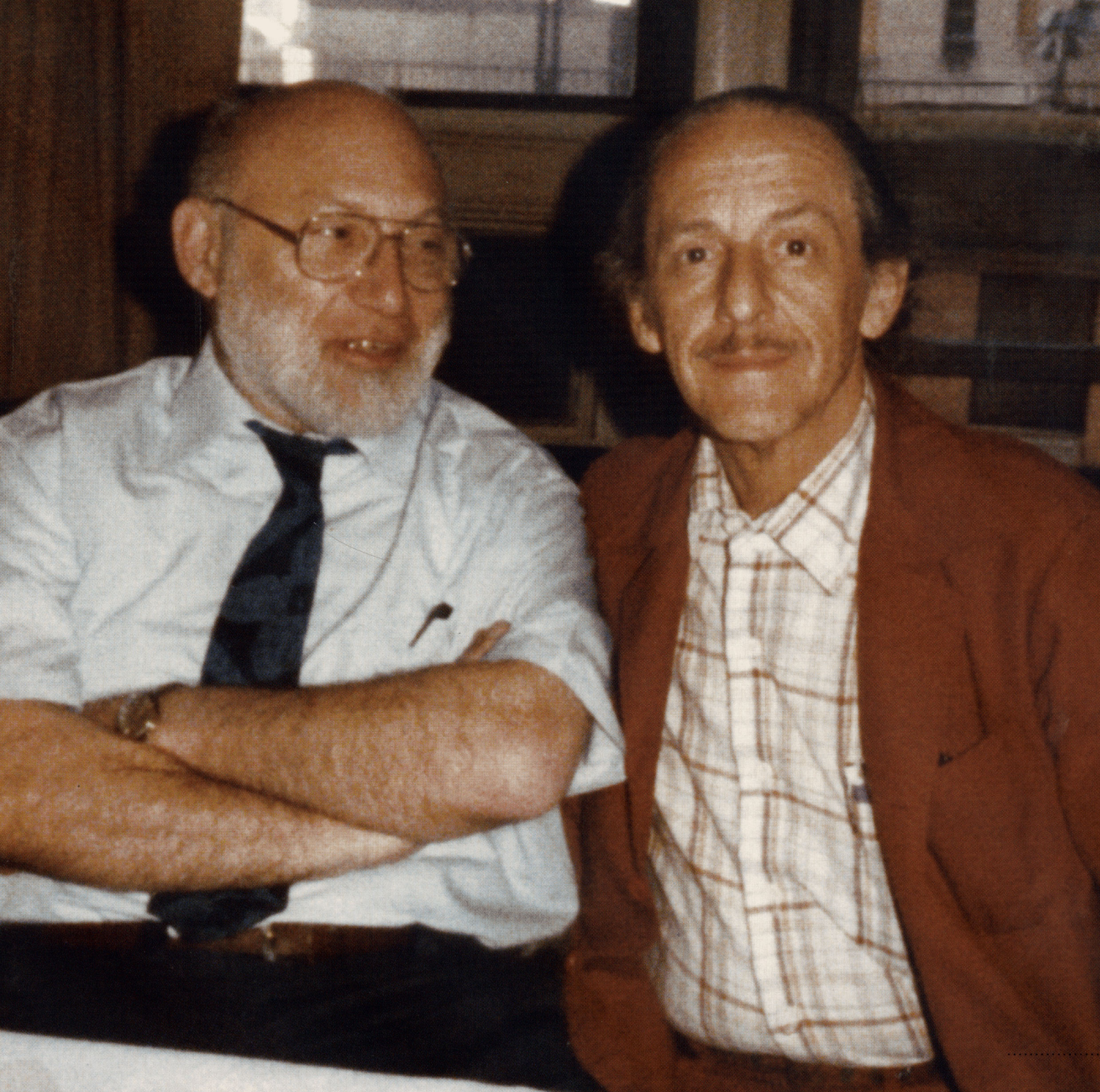


GARFIELD- LEDERBERG LETTERS

Although largely overlooked at the time of its publication, Eugene Garfield's 1955 *Science* article, "Citation Indexes for Science," so intrigued Stanford geneticist Joshua Lederberg that the young Nobel laureate wrote to its author in 1959 to find out what had become of the idea. Garfield and Lederberg's ensuing correspondence marked the beginning of a decades-long friendship and professional collaboration that led to the development of the Science Citation Index and *The Scientist*, among other ventures. In the following eight pages we reprint selections from these seminal letters.



May 9, 1959

To Eugene Garfield, from Joshua Lederberg

Since you first published your scheme for a "citation index" in *Science* about 4 years ago, I have been thinking very seriously about it, and must admit I am completely sold. In the nature of my work, I have to spend a fair amount of effort in reading the literature of collateral fields and it is infuriating how often I have been stumped in trying to update a topic, where your scheme would have been just the solution! I am sure your critics have simply not grasped the idea, and especially the point that the author must learn to cooperate by his own choice of citations and then he does the critical work

May 21, 1959

To Joshua Lederberg, from Eugene Garfield

... I hope you won't be embarrassed by a show of emotion, but your letter brought tears to my eyes. It then seemed that over six years of trying to sell the idea of citation indexes had not been completely in vain. You might be surprised how few people will take the time and trouble to scribble such a note. When asked, many endorse the idea, but don't get worked up about it enough to write spontaneously ...

You are so right when you say my critics have not grasped the idea. I try to be tolerant of those who have not had much time to study the problem. Even those who say it is a good idea frequently don't really know how they would use it – or how it differs from conventional indexing. As to opposition from the established outfits – there is no end of this. Chemical Abstracts pays lip service to Citation Indexes, but does nothing about them. Even my friends at Biological Abstracts and the *Current List* of medical literature who accept my judgment on many other conventional problems – look upon Citation Indexes as something impractical and unnecessary – particularly when there is so much more abstracting and regular indexing left undone.

... The most persistent of us need encouragement and I would feel justified now in pushing ahead for a citation index even if you were the only man to ever use it. I have great faith that the citation index will one day be a spur to many new scientific discoveries in the service of mankind.

June 18, 1959

To Eugene Garfield, from Joshua Lederberg

.... I think I have to agree with you that some advance work should be done to find the bugs in a working system, and I certainly feel this should have public support. In fact, I think it would if you were to resubmit now. I imagine your tactical error was in approaching the NSF at a time when, to put it bluntly, it was too broke to do more than a fraction of what it should. It is still not so well financed, and I think you might have better luck with another agency

I haven't given adequate thought to a reasonable experiment, but have some suggestions nevertheless. I would start with some *review* journal, the papers in which are most likely to define relevant connections to later work, and to be cited in them.

Suppose, for example, you scanned all the journals you now cover for *Current Contents* for citations to *Physiological Reviews* either for a specific year ... or for a definite period ...

You could now make a critical comparison. Take a few dozen titles from *Physiological Reviews* and ask a jury to suggest the range of subject-headings they would expect to define the connections of each review. Then compare what you have retrieved by CI with the subject indexes from, say Biological Abstracts or the *Current Lists* ...

Undated

To Joshua Lederberg, from Eugene Garfield

... Your idea of starting with a review journal is most interesting. Actually it is just the reverse kind of thinking I once applied in a paper in which I suggested that we use review articles as a source of index entries. However, I never thought of using the *Reviews* as the starting point for a citation index chain – and now that you mention it I think I can see the logic – I guess I didn't fully appreciate how much review papers are cited today ... Perhaps this has to do with the definition of a review paper.

... Were you thinking of this experiment as a means of convincing people further of the value of Citation Indexes as compared with conventional indexes? In the project I proposed to NSF we could easily have obtained the data you want. Perhaps in rewriting the proposal we can incorporate this as a specific experiment to be done along with others.

June 26, 1959

To Eugene Garfield, from Joshua Lederberg

... Regarding your proposal to NSF, and the correspondence related to it, I began to have some serious questions about the necessity of more research, and to wonder if in fact the concept hadn't already been well enough sold to the NSF reviewers. I had to concur with their expressed doubts about "exactly what you proposed to do" in the actual project, as it was written. My own feeling at the present time is that the utility and feasibility of citation-indexing are, in fact, self-evident; it is rather doubtful that any limited sample would serve to convince anyone else who did not already see the point. If you could visualize exactly what questions you might hope to answer by the project, I am sure you would find it much easier to enlist support for a pilot study ...

I can easily see that \$59,000 might be thought a wasteful expenditure if its main effect were to reprove the obvious, and especially if not very much more than this would be needed to get a useful product.

July 6, 1959

To Joshua Lederberg from Eugene Garfield

I would be willing to work up more data on what it would cost to compile a Citation Index, but I truly cannot afford to lay out the expense at the present time ... You know this Citation Index business is like arranging for a Yiddish wedding. If you really have a bang up affair with a lot of people coming they will all bring big presents and give the bride and groom plenty of cash. If you run a small intimate affair – it gets unnoticed in the paper, a few close relatives and friends show up – but they don't have to give big presents to prove their love ... I am afraid that Citation Indexes will have to be a big affair even if we are going to make a few people happy. If not then it may prove to be really wasted money ... We never intended that the study would merely establish that Cit. Indexes would be good things to have – it was intended to prove that they were practical to accomplish and that they would indeed achieve desirable results.

September 9, 1959

To Joshua Lederberg from Eugene Garfield

Since my last letter much progress has been made. I have met and spoken with Gordon Allen, George LeFevre, Miss Shapard and Miss Tolkan, the last three of NSF ...

... Here is a rundown on my discussions with Gordon Allen. To really demonstrate the value of a citation index we should somehow come up with as *complete* a citation index as possible to a selected list of journals and/or articles. Compiling a citation index to a selected list of articles would increase the problem of scanning the bibliographies and references in articles *from which* citations would be taken. For example, if a paper in *Nature* is included in our sample we would have to carefully examine citations to *Nature*.

... We agreed that some mechanical method must be developed for copying the citations. This has been acted on already. About two years ago I discussed the problem with the National Library of Medicine. They have a special microfilm camera for copying references ...

... We also discussed the question of specifying the "kind" of citation involved. Here is where we get into "intellectual" problems. I believe that citation index research will pay off handsomely in the future in that this research will characterize all the different ways in which people "cite" the earlier literature ...

October 6, 1959

To Eugene Garfield from Joshua Lederberg

... If you stick to your guns on the original principles of CI, I am sure you will find it widely used as a research tool, and further perfections will evolve. What we need more than anything else is to get it going ...

... You can be sure that if you set up CI for citations to *Science*, *Nature*, etc., that many authors will then take care to include more references to these journals which will help to ensure better coverage of the literature.

Briefly then, I would strongly urge the adoption of your proposal ... on a field of five to ten source journals, like *Science*, *Nature*, *PNAS* ... I would defer extending the field to specialty journals like *Genetics* until we can judge the utility of this first result ...

... My main aim, as you know, is to encourage you to get on with the work as simply and straightforwardly as possible. If it works out as well as it must, you should have little concern for enthusiastic support for your own research using CI.